

An Analysis of Agroecosystem and its Management

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ABSTRACT: *Agroecosystem management integrates economic, ecological, and social concepts to solve issues and find possibilities in natural environments that have been altered for the production of food and fiber. This article explains all there is to know about agroecosystems and their management, including the definition of an agroecosystem, the definition of management, and the main purpose of the management process. Agroecosystems management and problems are also discussed in this article. By using sustainable agroecosystems management: Economics, Society stresses the need of integrating ecology, the continuing significance of ecosystem views, and the necessity to integrate social, ecological, and economic concerns in agroecosystems research and management. With contributions from notable leaders in the area of sustainable agricultures, the scopes are really inter-disciplinary.*

KEYWORDS: *Agroecosystem, Agriculture, Ecosystem, Environment, Management.*

1. INTRODUCTION

The agroecosystem, which is informally defined as functionally and geographically coherent units of agricultural activity that contain both non-living and living components, as well as their interactions, is one of the most basic units of study in agro-ecology. Agroecosystems are subdivisions of traditional ecosystems. The human activities of agriculture, as the name suggests, are at the heart of the agroecosystem. Agroecosystems, on the other hand, do not only refer to the local locations of agricultural activities (such as farms), but also to the regions that are affected by such activities, such as changes in the complexity of species assemblages, energy fluxes, and net nutrient balances. To begin, certain distinctions must be made, such as the difference between agroecosystems and agricultural technology systems. Agroecosystem is a delimited area with a complex of water, air, plants, soil, microbes, animals, and everything else that has been adapted for agricultural production. The scale of an agroecosystem is entirely up to you. It may be a solitary field, a tiny family farm, or a town, county, or city's agricultural landscape[1].

Traditionally, agroecosystems, particularly those that are highly managed, have been described as having a simpler species, energy and composition, and nutrient fluxes than "wild" ecosystems. Similarly, the agroecosystem is often linked to increased nutrient inputs, with most of what leaves the farm leading to eutrophication of connected ecosystems. Agricultural landscapes comprise about 41% of the world's surface areas, and agriculture is the most widely used land management technique. Fruit, fiber, and fuel production are the main goals of agriculture. As part of a healthy ecosystem, agriculture plays a unique function in both demand and supply for many natural resources. Power, by revealing the human well-dependence being's on these services Agricultural settings need and supply a variety of ecosystem resources, but they also perform a number of functions. The ecosystem service architecture has lately been discussed in the literature, indicating the necessity for better management of public and private elements convergence. This method permits both economic assessments of environmental resources and the integration of various value domains. The ES concept considers both the indirect and direct benefits that agroecosystems provide to people when applied to agriculture[2]. According to the Millennium Ecosystem Assessment, ecosystem resources are divided into four categories: provisioning ecosystem resources (energy outputs or material), controlling ES (biophysical process delivering benefit), and supporting ecosystem resources (process required to provide different ecosystem services), and cultural ecosystem resources (spiritual benefits, aesthetic, recreational). There are many problems that stymie rural development. Agriculture and the environment have an inextricable and pervasive relationship, which results in a slew of problems. Climate, soil, water, sunshine, and biological creatures all

have a role in agricultural growth. However, in the agricultural production process, this is not the case. Modern man-made components include pesticides, fertilizers, equipment, and carefully bred plants and animals. This interacts with the world in a variety of ways, sometimes adversely, and often to the point of causing harm or loss to natural resources essential to agriculture[3].

Agroecosystem is a limited area including a complex of plants, water, animals, oil, air, ls, microbes, and everything else suited for agricultural production. Agroecosystems may be whatever size you want. It may be a single field, a tiny family farm, or a town, province, or country's agricultural landscape. To transform an ecosystem into an agroecosystem, a number of significant modifications are required. The system's limits become more clearly defined, at least in terms of biological and physico-chemical boundaries. As the links with other networks grow clearer and less porous, they shrink and channel. The technique is further simplified by the absence of some natural physico-chemical systems and the removal of most of the current fauna and vegetation. However, the introduction of human administration and operation has added to the system's complexity. Management is the process of organizing and administering activities in order to achieve a goal. Administration tasks include developing organizational strategies and coordinating human activity to achieve objectives with limited resources. Organizing, planning, leading, and controlling are the four major responsibilities that managers must play in the management process. It's worth noting that management isn't always a straight line. Because it is impossible to prepare for every problem that an organization may encounter, it does not always start with preparation and proceed through each step before achieving organizational goals. Corrections and modifications are performed when unforeseen events occur throughout the management process. Managers guarantee that the necessary changes are implemented, as well as that the process's unity and dignity are maintained[4].

1.1 Planning:

Identifying the organization's success expectations and determining the actions and services required to meet them are all part of the planning process. By planning, management determines what the organization's future should be and how it will get there. Strategic plans are long-term in nature and have an impact on the whole organization. A strategic plan connects the dots between a company's current state and its desired future state. Tactical schedules are used to turn development plans into actual actions that may be carried out by groups throughout the business. What has to be done, who will execute it, and how much it will cost are all outlined in the tactical plan. ThyssenKrupp decided to become a servicing elevator and manufacturing company because to increased competition from Chinese steels. The company's management established a goal for itself to earn the majority of its revenue from elevator operations. To do this, the management team devised strategies to create partnerships or acquire existing elevator companies. The group developed techniques for acquiring external content resources and generating new human capital. The company had to sell its steel-related assets in order to finance the new initiative. This is an example of a long-term strategic plan that may take years to execute and will need many revisions. It does, however, start with the defining of a goal and a rough plan for getting there[5].

1.2 Organizing:

Following the development of plans, decisions must be made about how to carry them out more effectively. The organizing purpose involves reaching an agreement on the organization's structure (by departments, matrix teams, job responsibilities, etc.). Organizing entails delegating authority and responsibility to various agencies, distributing funds across the organization, and deciding how organizations and people's activities may be coordinated. Management had to find out how to finance two very different sets of activities if ThyssenKrupp AG was to achieve its long-term goal. As the focus shifted to elevator manufacture, management sought to keep steel production going to guarantee a continuous flow of cash. It was also necessary to develop new knowledge and technologies in order to enhance the company's elevator capabilities. When one of the company's activities was reduced and the other was expanded, it was critical to develop a new corporate structure that could handle all of the company's operations[6].

1.3 *Leading:*

Almost all of an organization's achievements are due to its people. Even the greatest preparations and planning will fail if people in the group are unable to assist the effort. Leaders inspire enthusiasm and encourage others to work hard to accomplish their goals by using their intellect, character, and charm. Managers must also inspire high performance by communicating expectations across the company, encouraging commitment to a common purpose, developing shared values and community, and encouraging high performance. Managers may use incentive and punishment to persuade employees to support their goals and priorities. Leaders inspire others to believe in and follow through on their goals. Although leadership and management abilities are not interchangeable, they certainly exist in the most successful people. It's difficult to keep workers engaged when plans ask for dramatic adjustments like downsizing and layoffs. By nature, many people are resistant to change. People are very hesitant to change, especially if it involves losing their employment or position. ThyssenKrupp's trade unions were outspoken in their opposition to the company's shift from steel to elevator manufacturing. While those in charge of the new business operations are pleased with the preparations, those in charge of steel production are dissatisfied and demotivated. Management would have been wise to seek union support for its vision of the company's new destiny[7].

1.4 *Controlling:*

According to a well-known military proverb, no battle plan survives confrontation with the enemy. This implies that, although preparation is essential for creating plans, things will not go as planned when the time comes to put the timetable into effect. Unforeseen events will occur. Controlling is the act of seeing and responding to what happens in the real world. The control process includes monitoring activities, evaluating efficiency, comparing results to expectations, and making adjustments and modifications as needed. This is often referred to as a feedback loop, as shown in the example of a product creation feedback loop[8].

1.4 *Agro-ecosystem Managements:*

To address a problem and a discovery opportunity, agroecosystem management incorporates ecological, social, and economic value. Diversification in the agroecosystem offers a number of benefits, including the construction of structures. SOC, or security operation control, reduces insects, pests, and disease, which may result in increased agricultural production and enhanced ecological service over time. Agroecosystem management integrates economic, ecological, and social principles to solve issues and uncover opportunities. It takes into account everything from the ground under your feet to the farms and communities of your neighbours, as well as the journey from farm to market to consumer.

- What it means to be a farmer is to find a farming method that pays well, that your neighbours and society want to support and protect, and that your children want to continue.
- For a scientist, this entails working with farmers at the nexus of agricultural disciplines. It entails seeing agriculture as a system, with all problems and possibilities emerging as assets rather than components of the system.
- It refers to the frameworks for all of your courses and experiences, regardless of how wide your studies are, as well as the links between specialized courses and Ohio agricultures for students interested in agricultural.
- It's defined by environmentalists as an agricultural technique that enhances environmental values like biodiversity while being economically viable.
- It entails exploring entrepreneurial possibilities that help both the socioeconomic and environmental bottom lines for a businessperson.
- To a consumer, agriculture may be expected to offer nutritious meals from a healthy environment, as well as excellent returns to farmers.
- This guarantees that long-term advantages in cultural, economic, and social dimensions exceed short-term profits in one of these areas for politicians[9].

1.5 Challenges To Agro-ecosystem Management:

Over time, population growth and other demographic changes may have varying impacts on ecosystems. As a consequence of population increase and urban development, more people would consume more energy, placing greater pressure on ecological systems. Increasing populations require more livable and arable land, which often leads to habitat change and, eventually, ecological collapse. Food agriculture, security, climate change, and ecological resources are all becoming more negative. Food security is threatened by reduced yields related to decreased water quantity and quality, loss of other natural resources (such as soil fertility), and the simplification of agricultural systems that have lost their inherent biotic components for managing insect and disease infestations. Unsustainable agricultural practices may have serious negative implications for livelihoods and ecosystem functioning, and they can impede or reverse production gains in the long term, increasing poverty. Other natural resources such as soil, oil, and phosphorus, on the other hand, are projected to be scarce by the end of the century. Other ecological services are impacted by farmland reactivation attempts, such as the usage of agrochemicals. Dyes, through delivering useful ecosystem services, have an impact on agroecosystems and their growth processes in reality. More demands are placed on land, water, and other services as the world's population, GDP (Gross Domestic Product), and consumption continue to increase. As a consequence of the deterioration, poor people living in fragile ecosystems, particularly those whose livelihoods rely largely on agricultural operations, may suffer food insecurity. Diversify or multi-functional agroecosystems is a novel method to addressing the deterioration of natural resource base quality. Agricultural growth has evolved from a purely technical problem to a more dynamic one involving social, cultural, political, and economic elements. Multifunctional agroecosystems offer a variety of environmental services, including soil and water quality management, carbon sequestration, biodiversity support, sociocultural services, and food production. These activities, in turn, rely on ecological services provided by adjacent natural habitats, such as biological pest control, pollination, fertilization, soil structure, hydrological services, and nutrient cycling. The loss of wildlife habitat, nitrogen run-off, river sedimentation, greenhouse gas pollution, and pesticide poisoning of people and non-target animals are all examples of bad agroecosystem management. This chapter discusses the difficulties of agroecosystem management, as well as how adopting a diversified approach may help farmers produce more efficiently and sustainably in an uncertain environment[10].

2. DISCUSSION

Various researchers have studied and evaluated the agroecosystem and its management, but they have not explained some issues such as agroecosystem definitions, management definitions, and agroecosystem management difficulties. This paper discusses the meaning of agroecosystem and its management, including the definition of agroecosystem (agro ecosystem is a basic unit of research in agroecology, and is loosely defined as functionally and spatially coherent units of agricultural activity, and includes nonliving and living components involved in the unit and their interaction), the definition of management (organization and administration), and the definition of agroecosystem (agro ecosystem is a basic unit of research in agro Setting the organization's strategy and coordinating human activity to achieve these goals while working with restricted resources are examples of administration's actions), and management's main role (Planning, Controlling, Organizing, and leading). This article also covers the management of agroecosystems and the difficulties that come with it. By using sustainable agroecosystems management: Economics, Society stresses the need of integrating ecology and the continued significance of ecosystem views, as well as the necessity to integrate social, ecological, and economic concerns in agroecosystems research and management. Truly Scopes are multi-disciplinary, with contributions from recognized leaders in the area of sustainable agriculture.

3. CONCLUSION

This paper explains everything about agroecosystems and their management, including the definition of agroecosystems (agroecosystems are basic units of research in agroecology, and are loosely defined as functionally and spatially coherent units of agricultural activity that include nonliving and living components and their interactions), the definition of management (o Setting the organization's strategy and coordinating staff actions to achieve these goals while working with restricted resources are examples of administration's activities), and management's main role (Planning, Controlling, Organizing, and leading). This article also

discusses the management of agroecosystems and the difficulties that this management poses. By using sustainable agroecosystems management: Economics, Society stresses the need of integrating ecology, the continued significance of ecosystem views, and the necessity to integrate social, ecological, and economic concerns in agroecosystems research and management. Truly Scopes are multi-disciplinary, with contributions from recognized leaders in the area of sustainable agriculture.

REFERENCES:

- [1] “Agroecosystem sustainability: developing practical strategies,” *Choice Rev. Online*, 2001, doi: 10.5860/choice.38-4456.
- [2] K. A. Barbarick, J. A. Ippolito, J. McDaniel, N. C. Hansen, and G. A. Peterson, “Biosolids application to no-till dryland agroecosystems,” *Agric. Ecosyst. Environ.*, 2012, doi: 10.1016/j.agee.2012.01.012.
- [3] K. Hanaček and B. Rodríguez-Labajos, “Impacts of land-use and management changes on cultural agroecosystem services and environmental conflicts—A global review,” *Glob. Environ. Chang.*, 2018, doi: 10.1016/j.gloenvcha.2018.02.016.
- [4] *Sustainable agroecosystems in climate change mitigation*. 2014.
- [5] W. Xu and J. A. Mage, “A review of concepts and criteria for assessing agroecosystem health including a preliminary case study of Southern Ontario,” *Agriculture, Ecosystems and Environment*. 2001, doi: 10.1016/S0167-8809(00)00159-6.
- [6] B. M. Mirkin, Y. T. Suyundukov, and R. M. Khaziakhmetov, “Management of an agroecosystem,” *Russ. J. Ecol.*, 2002, doi: 10.1023/A:1014496623592.
- [7] Z. Cao and R. Dawson, “Modeling circulation function in agroecosystems,” *Ecol. Modell.*, 2005, doi: 10.1016/j.ecolmodel.2004.06.041.
- [8] H. M. G. van der Werf, “Agroecosystems analysis,” *Agric. Syst.*, 2005, doi: 10.1016/j.agry.2004.08.006.
- [9] B. Bradshaw and B. Smit, “Subsidy removal and agroecosystem health,” *Agric. Ecosyst. Environ.*, 1997, doi: 10.1016/S0167-8809(97)00042-X.
- [10] H. Augstburger, J. Jacobi, G. Schwilch, and S. Rist, “Agroecosystem service capacity index - A methodological approach,” *Landsc. Online*, 2018, doi: 10.3097/LO.201864.

